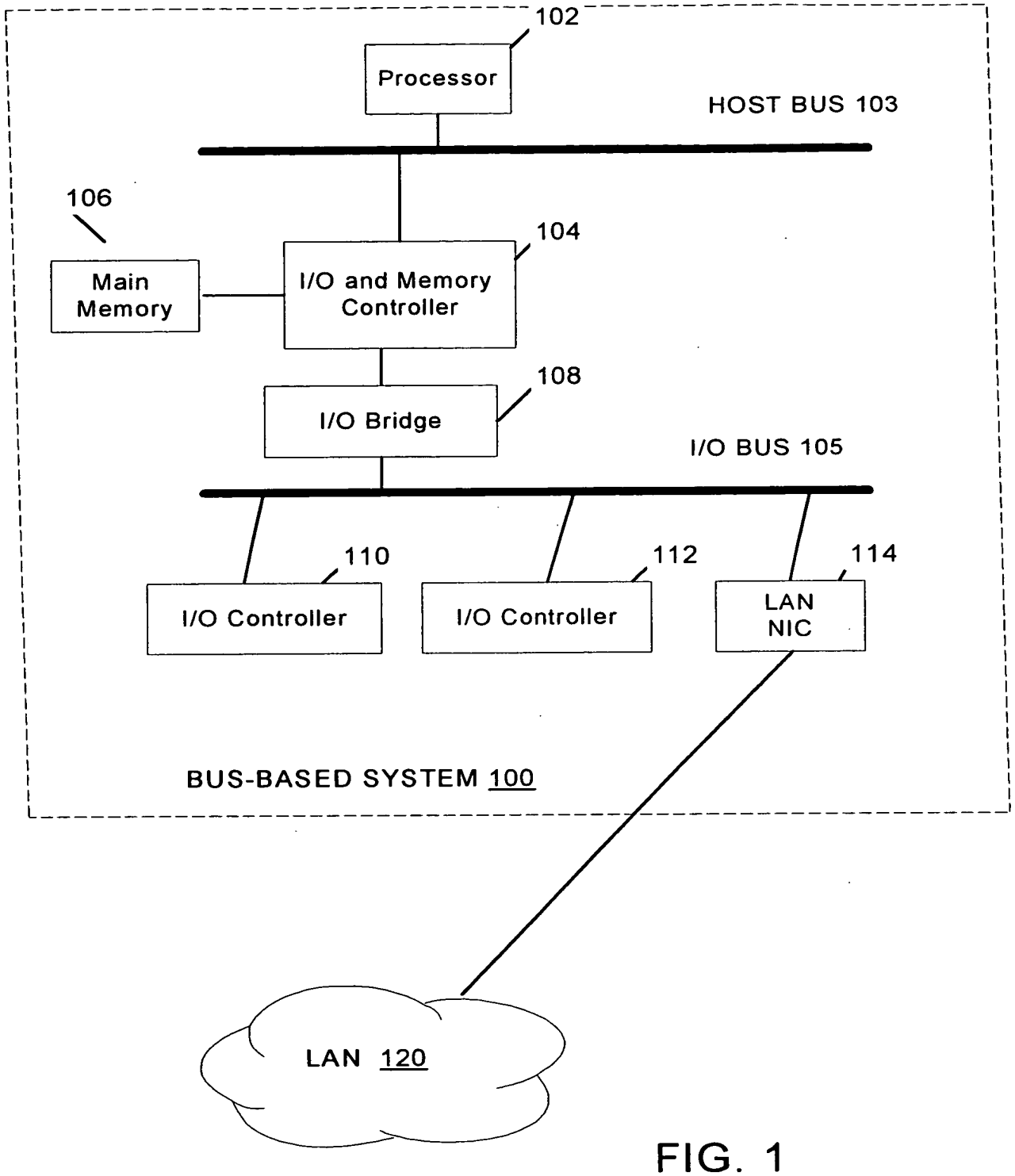

102
Processor
HOST BUS 103
106
Main Memory
104
I/O and Memory Controller
108
I/O Bridge
I/O BUS 105
110
I/O Controller
112
I/O Controller
114
LAN NIC
BUS-BASED SYSTEM 100
LAN 120

FIG. 1

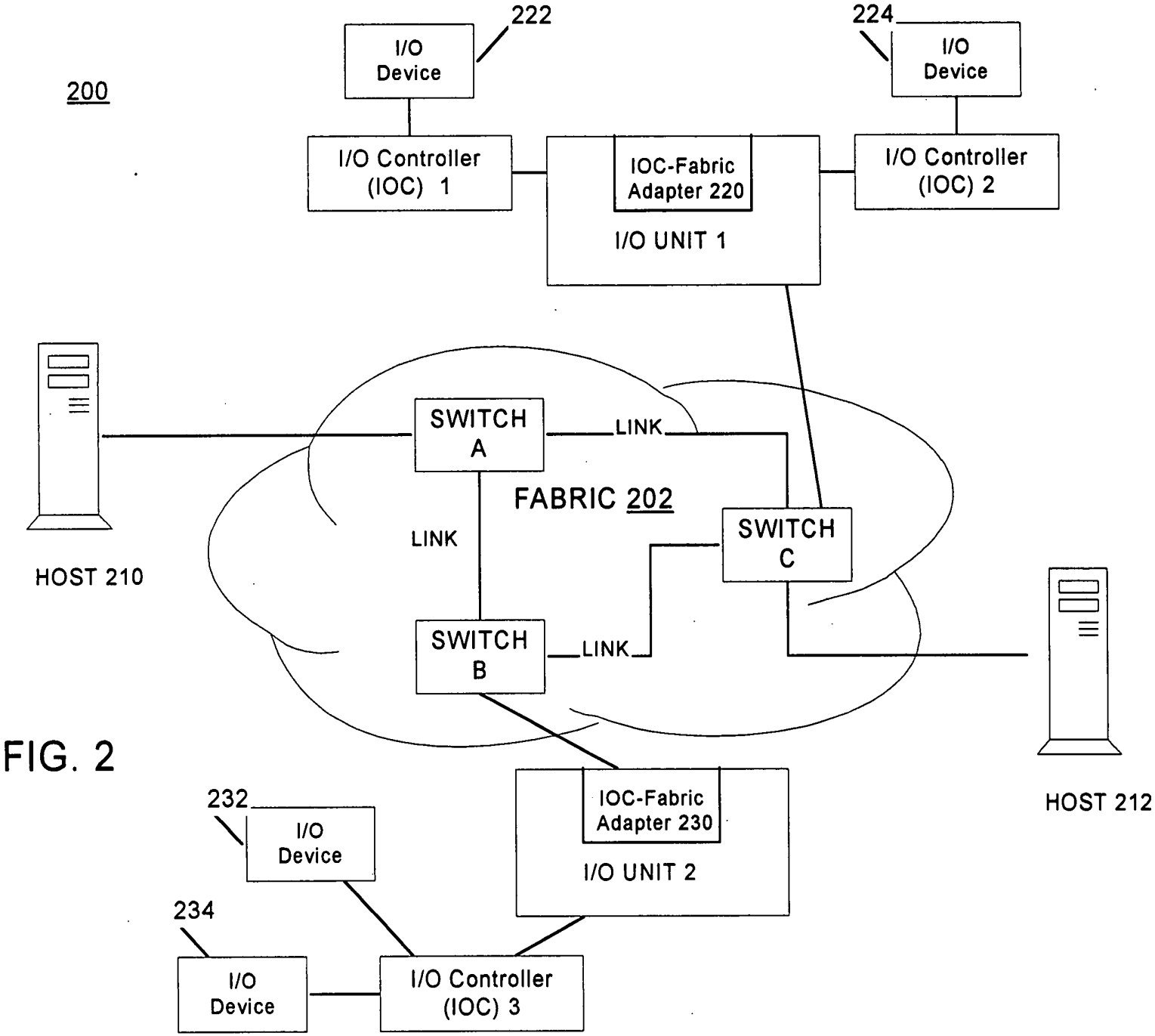

200
222
I/O Device
224
I/O Device
I/O Controller (IOC) 1
IOC-Fabric Adapter 220
I/O UNIT 1
I/O Controller (IOC) 2
HOST 210
SWITCH A
LINK
FABRIC 202
LINK
SWITCH C
SWITCH B
LINK
HOST 212
232
I/O Device
IOC-Fabric Adapter 230
I/O UNIT 2
234
I/O Device
I/O Controller (IOC) 3

FIG. 2

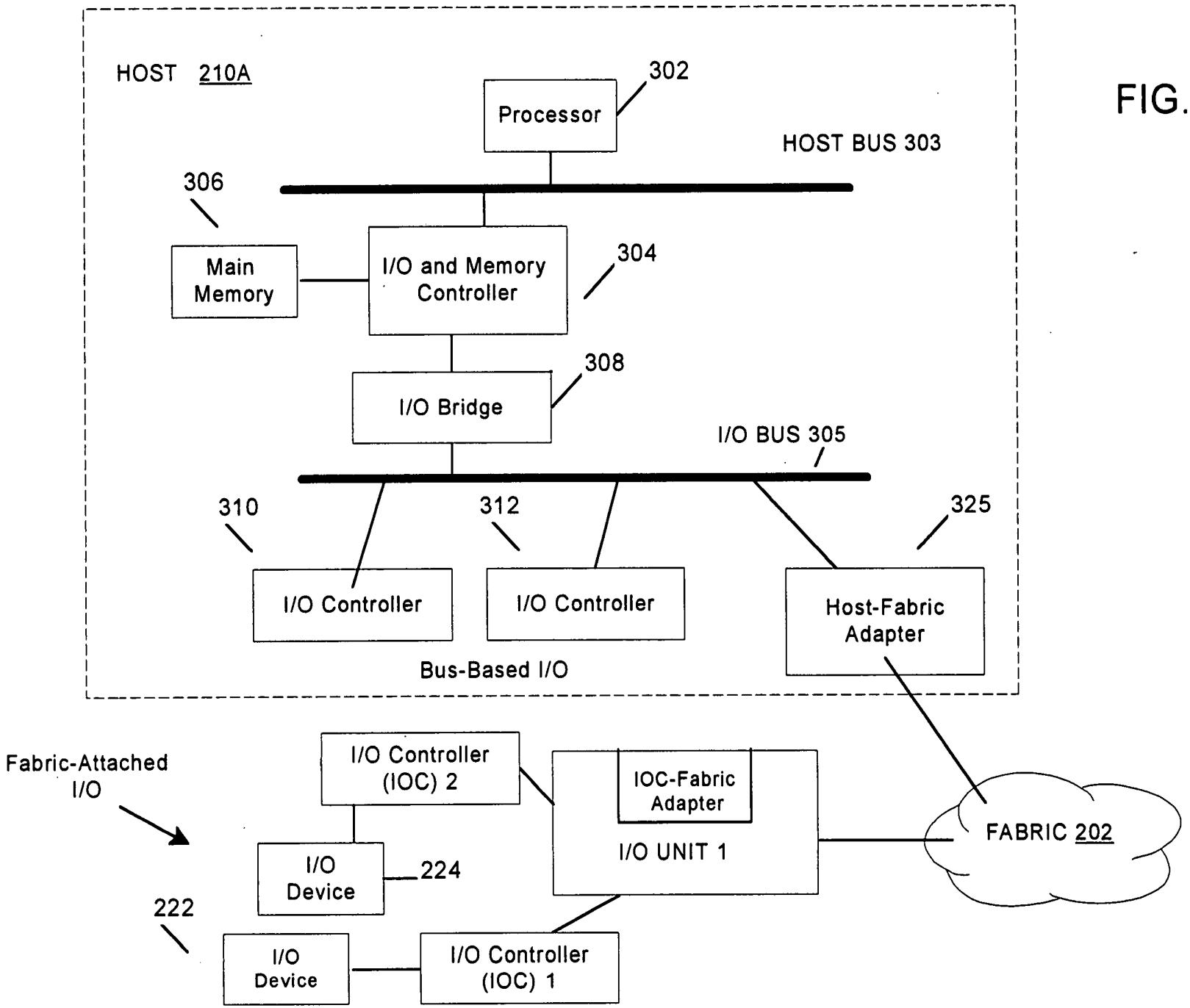

HOST 210A
Processor
302
HOST BUS 303
306
Main Memory
I/O and Memory Controller
304
I/O Bridge
308
I/O BUS 305
310
312
325
I/O Controller
I/O Controller
Host-Fabric Adapter
Bus-Based I/O
Fabric-Attached I/O
I/O Controller (IOC) 2
IOC-Fabric Adapter
I/O UNIT 1
FABRIC 202
I/O Device
224
222
I/O Device
I/O Controller (IOC) 1

FIG. 3

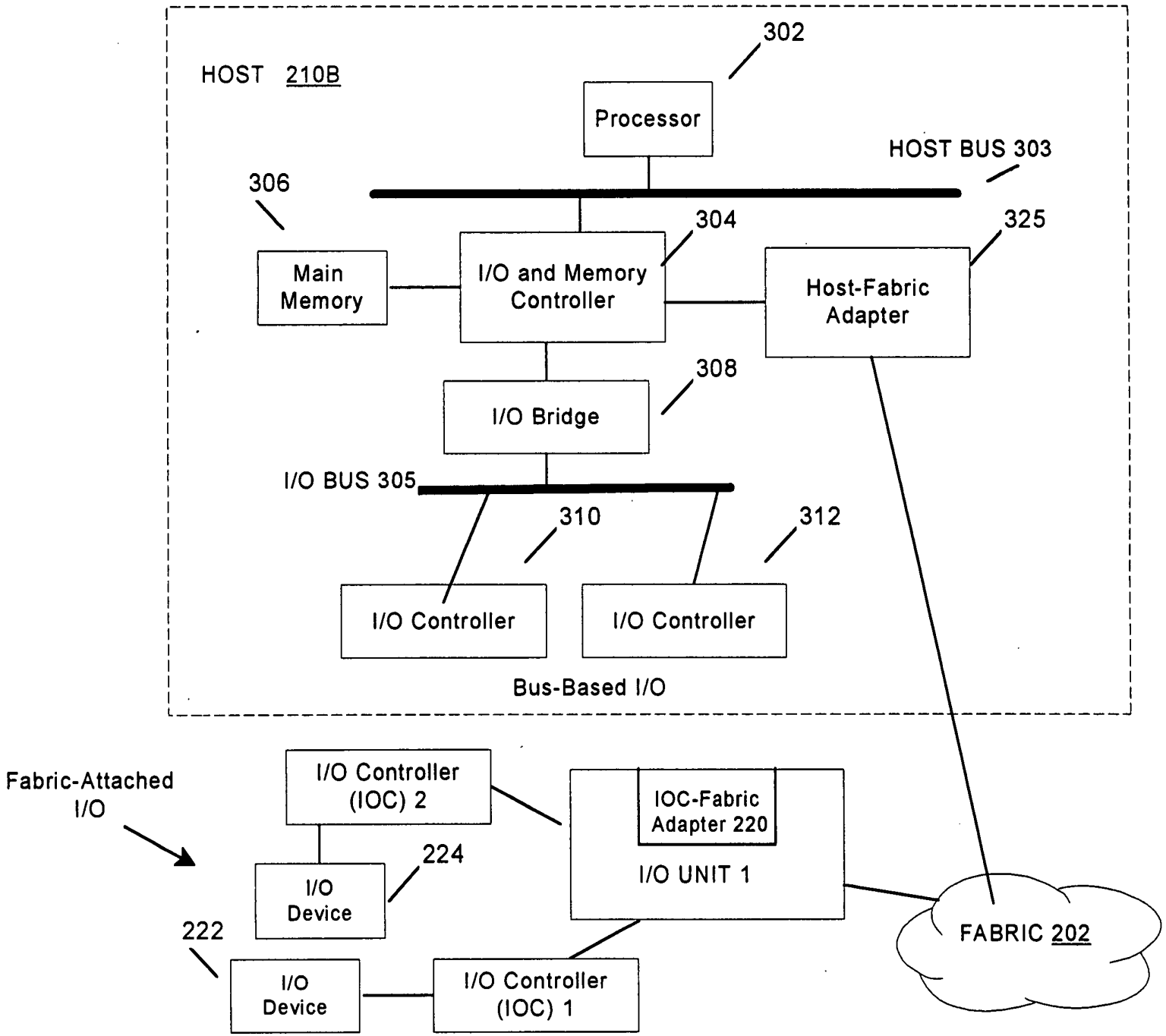
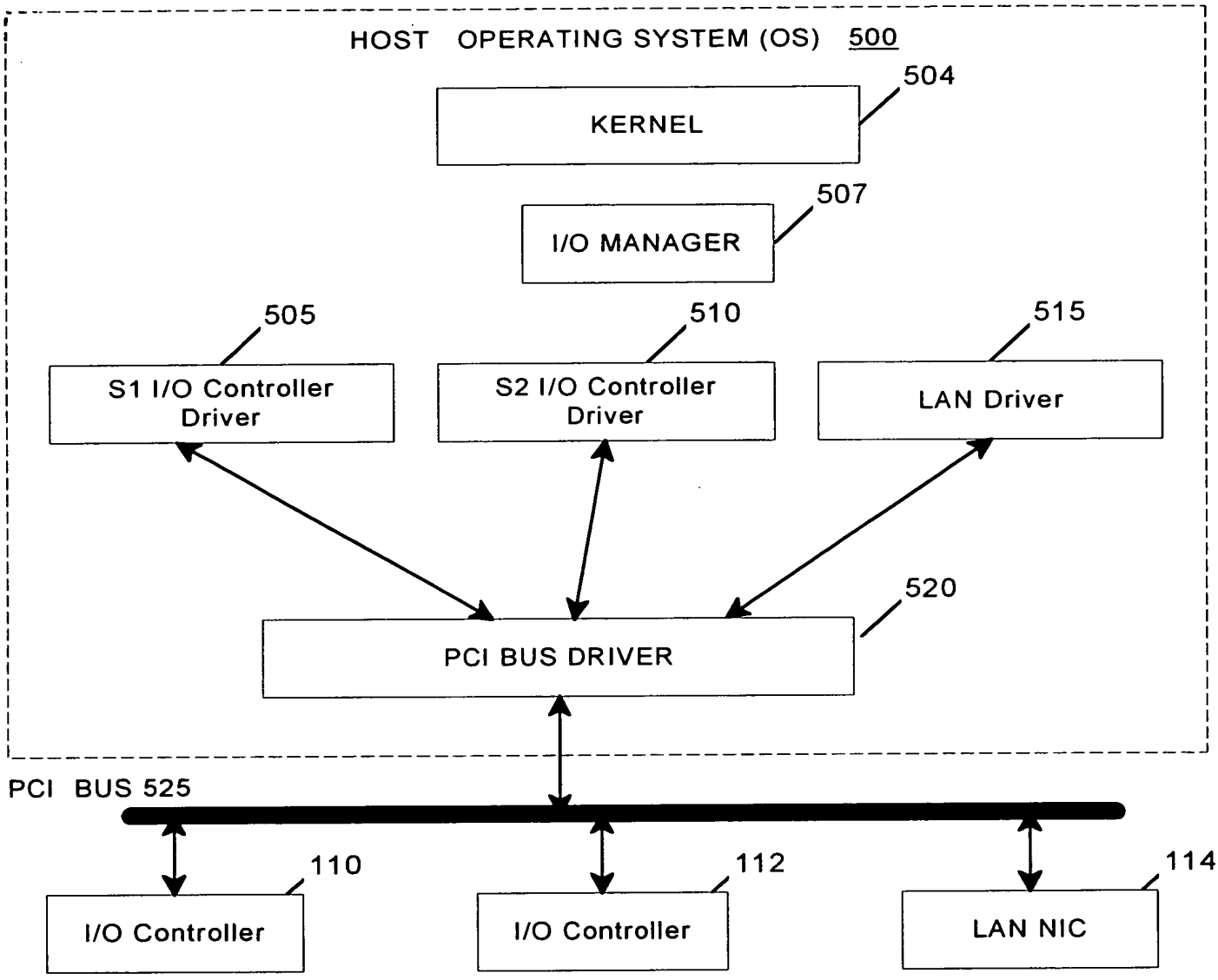
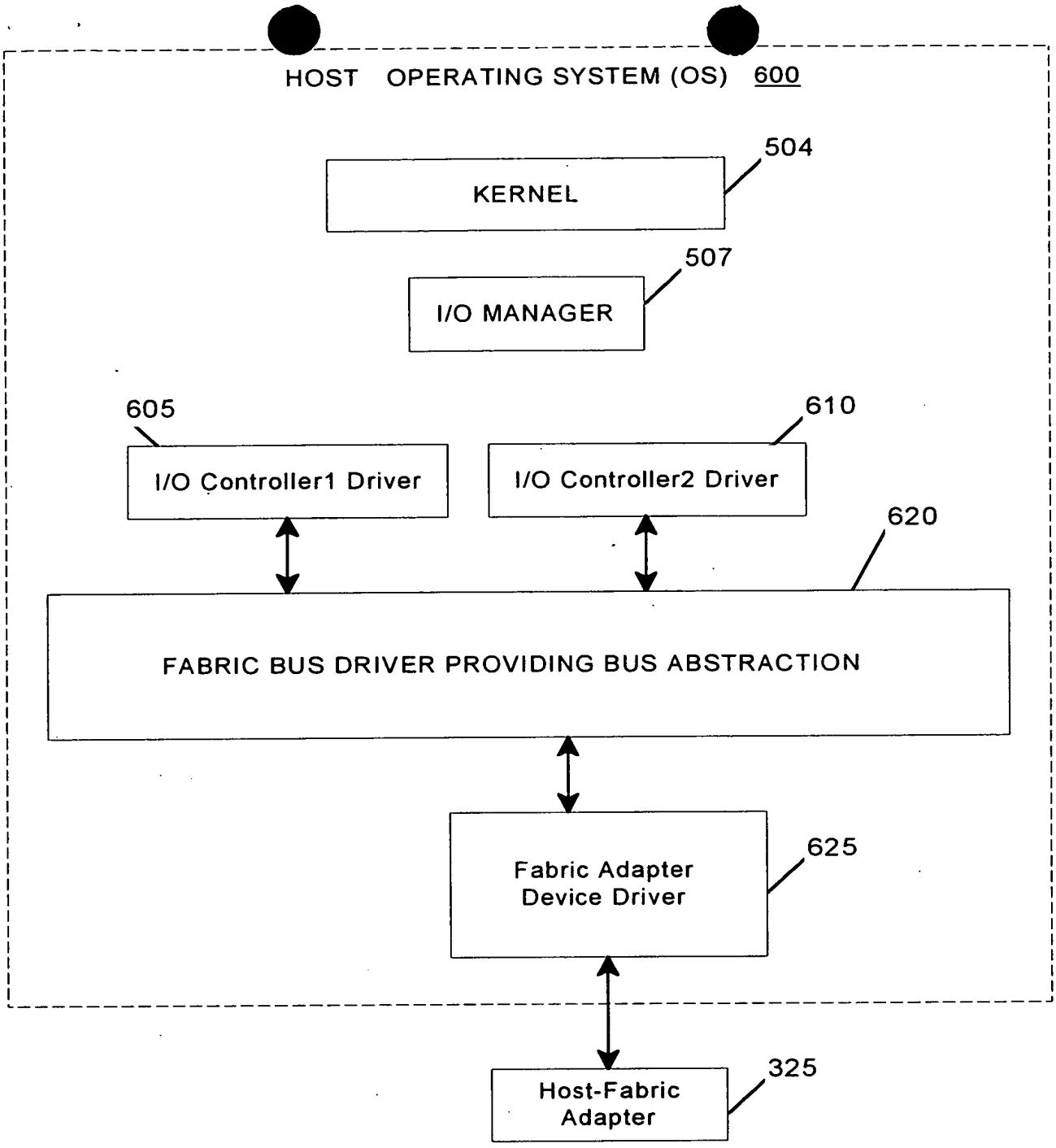

HOST 210B
302
Processor
HOST BUS 303
306
304
325
Main Memory
I/O and Memory Controller
Host-Fabric Adapter
308
I/O Bridge
I/O BUS 305
310
312
I/O Controller
I/O Controller
Bus-Based I/O
Fabric-Attached I/O
I/O Controller (IOC) 2
IOC-Fabric Adapter 220
224
I/O Device
I/O UNIT 1
222
I/O Device
I/O Controller (IOC) 1
FABRIC 202

FIG. 4



EXAMPLE SOFTWARE DRIVER STACKS FOR HOST HAVING BUS-BASED I/O

FIG. 5



EXAMPLE SOFTWARE DRIVER STACKS FOR HOST HAVING FABRIC-ATTACHED I/O

FIG. 6

CLOSE FIGURE

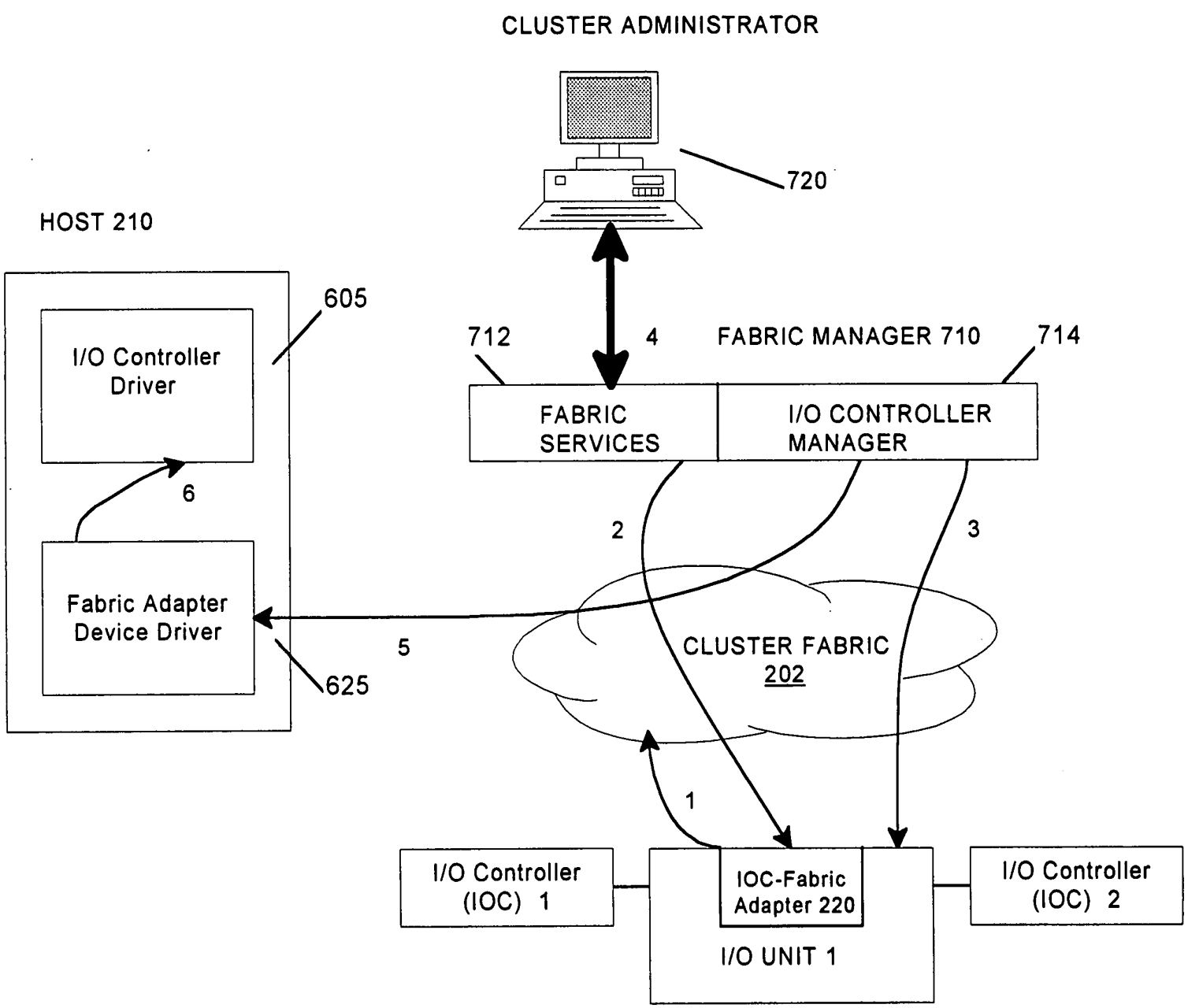
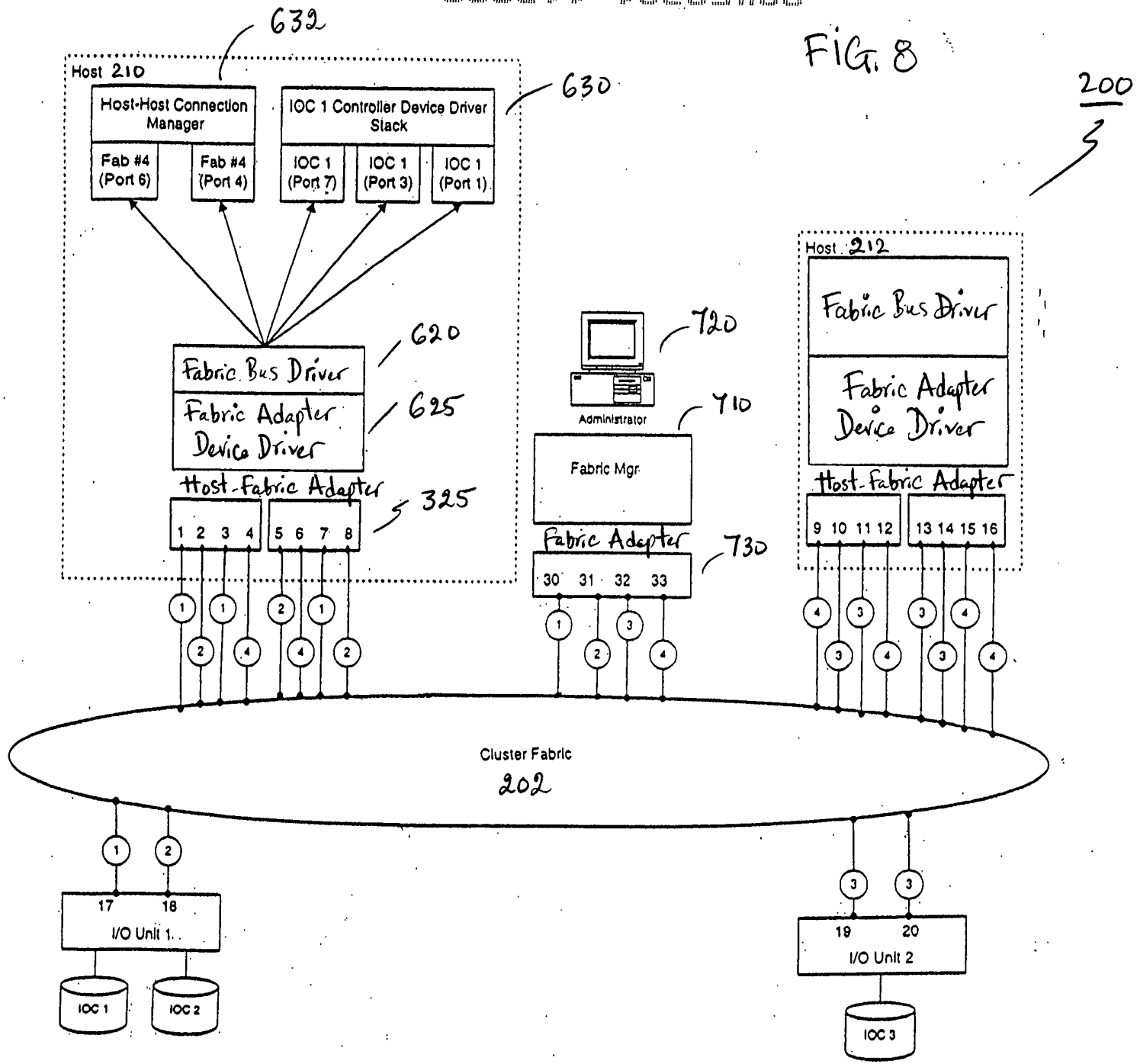


FIG. 7

SUBSTITUTE SHEET (RULE 26)

FIG. 8



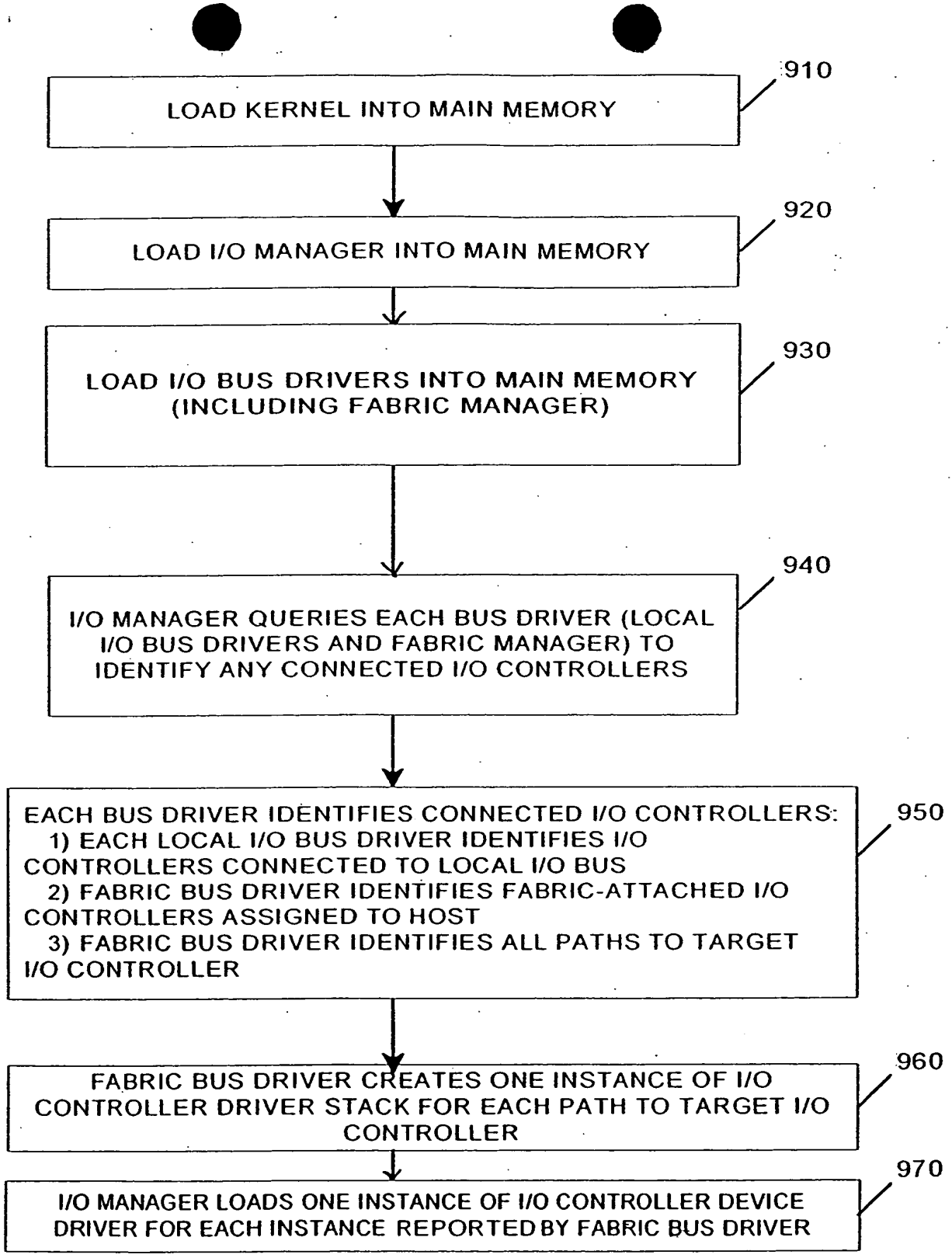

910
LOAD KERNEL INTO MAIN MEMORY
920
LOAD I/O MANAGER INTO MAIN MEMORY
930
LOAD I/O BUS DRIVERS INTO MAIN MEMORY (INCLUDING FABRIC MANAGER)
940
I/O MANAGER QUERIES EACH BUS DRIVER (LOCAL I/O BUS DRIVERS AND FABRIC MANAGER) TO IDENTIFY ANY CONNECTED I/O CONTROLLERS
950
EACH BUS DRIVER IDENTIFIES CONNECTED I/O CONTROLLERS:
1) EACH LOCAL I/O BUS DRIVER IDENTIFIES I/O CONTROLLERS CONNECTED TO LOCAL I/O BUS
2) FABRIC BUS DRIVER IDENTIFIES FABRIC-ATTACHED I/O CONTROLLERS ASSIGNED TO HOST
3) FABRIC BUS DRIVER IDENTIFIES ALL PATHS TO TARGET I/O CONTROLLER
960
FABRIC BUS DRIVER CREATES ONE INSTANCE OF I/O CONTROLLER DRIVER STACK FOR EACH PATH TO TARGET I/O CONTROLLER
970
I/O MANAGER LOADS ONE INSTANCE OF I/O CONTROLLER DEVICE DRIVER FOR EACH INSTANCE REPORTED BY FABRIC BUS DRIVER

FIG. 9

SECRET RESTRICTED

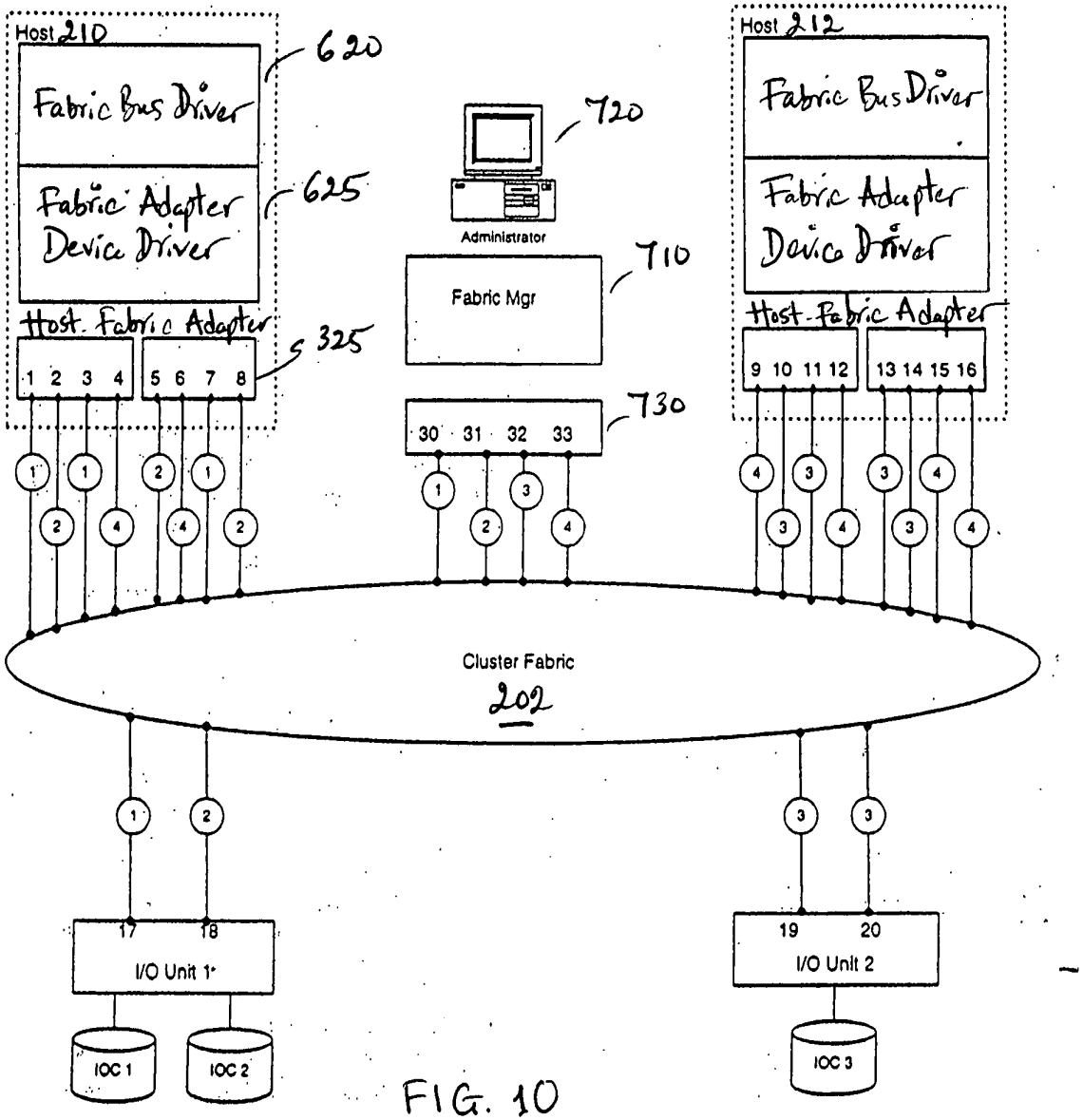


FIG. 10

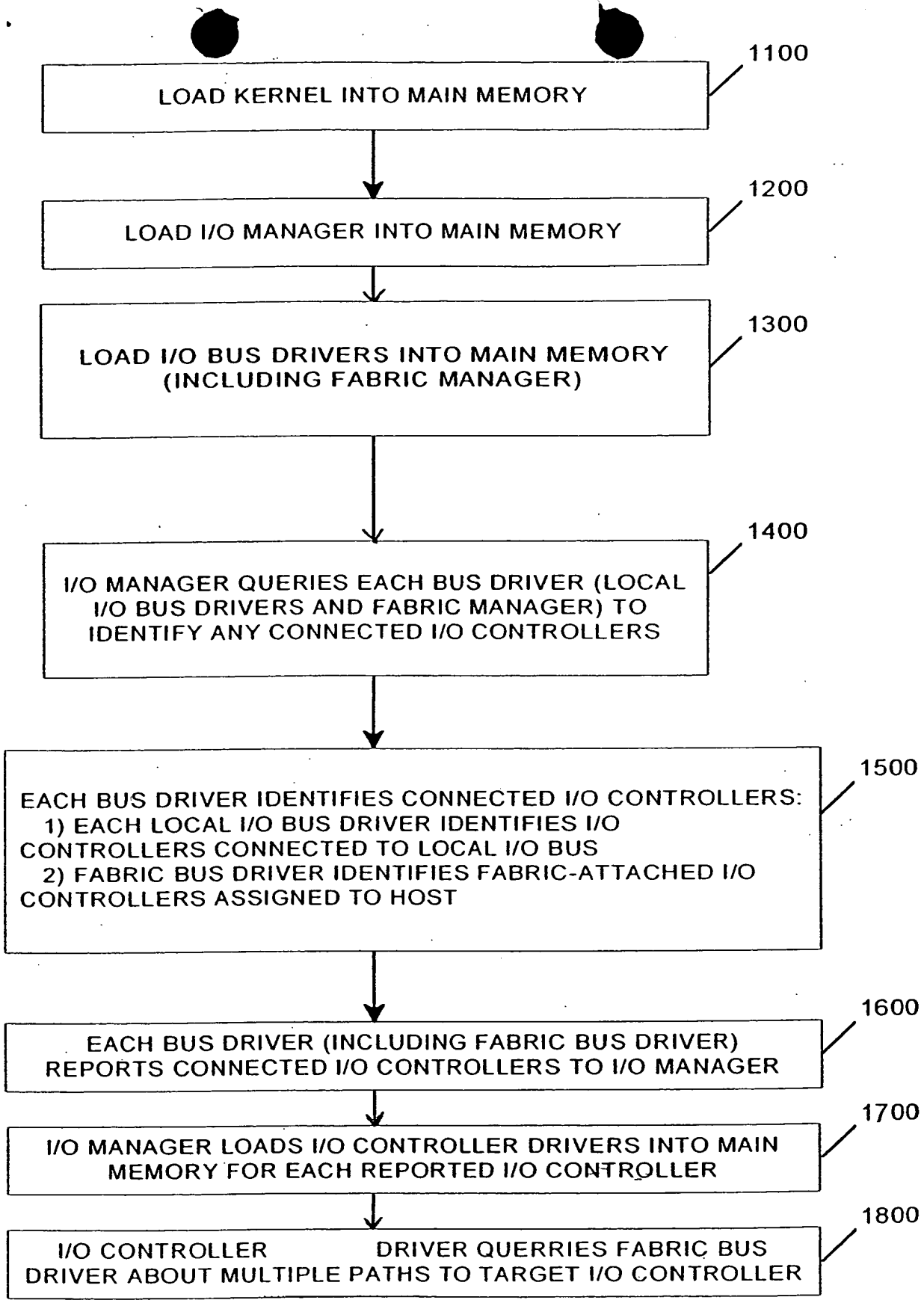

LOAD KERNEL INTO MAIN MEMORY
1100
LOAD I/O MANAGER INTO MAIN MEMORY
1200
LOAD I/O BUS DRIVERS INTO MAIN MEMORY (INCLUDING FABRIC MANAGER)
1300
I/O MANAGER QUERIES EACH BUS DRIVER (LOCAL I/O BUS DRIVERS AND FABRIC MANAGER) TO IDENTIFY ANY CONNECTED I/O CONTROLLERS
1400
EACH BUS DRIVER IDENTIFIES CONNECTED I/O CONTROLLERS:
1) EACH LOCAL I/O BUS DRIVER IDENTIFIES I/O CONTROLLERS CONNECTED TO LOCAL I/O BUS
2) FABRIC BUS DRIVER IDENTIFIES FABRIC-ATTACHED I/O CONTROLLERS ASSIGNED TO HOST
1500
EACH BUS DRIVER (INCLUDING FABRIC BUS DRIVER) REPORTS CONNECTED I/O CONTROLLERS TO I/O MANAGER
1600
I/O MANAGER LOADS I/O CONTROLLER DRIVERS INTO MAIN MEMORY FOR EACH REPORTED I/O CONTROLLER
1700
I/O CONTROLLER DRIVER QUERRIES FABRIC BUS DRIVER ABOUT MULTIPLE PATHS TO TARGET I/O CONTROLLER
1800

FIG. 11